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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/788,508	02/27/2004	Gordon James Johnston Bartley	090936.0546	7422

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PATENT DEPARTMENT  
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EXAMINER

STRICKLAND, JONAS N

ART UNIT PAPER NUMBER

1754

DATE MAILED: 09/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/788,508

Applicant(s)

JOHNSTON BARTLEY ET AL.

Examiner

Jonas N. Strickland

Art Unit

1754

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 June 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7,9-16 and 18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7,9-16 and 18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Response to Amendment***

1. This Detailed Action is in response to the amendment filed on 6/22/05. The Applicant has amended claims 1, 3-5, 10, and 12-14. Claims 8 and 17 have been cancelled. No new matter has been added to the instantly claimed invention.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1, 3, 7, 9, 10, 12, 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguro et al. (US Patent 5,441,401) in view of EP 637,968, Muradov (US Patent 6,653,005) and the admitted of prior art Hornung et al. (p. 8, line 31 – p. 9, line 5 of the instant specification).

Yamaguro discloses an apparatus for decreasing nitrogen oxides in a combustion device, wherein the exhaust gas is discharged as a result of continuous combustion with hydrogen gas so that the nitrogen oxides can be removed by a catalytic reduction reaction with the purifying catalyst. The amount of hydrogen gas supplied need only be enough to reduce the nitrogen oxide content in the exhaust gas. The hydrogen gas is obtained by modification of fuel water vapor and by a partial

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combustion process (col. 3, lines 20-39). Yamaguro et al. continues to disclose a partial oxidation unit (shift converter) operable to receive a portion of the fuel from the main fuel line to partially oxidize the fuel to produce a gas mixture containing hydrogen, and to deliver the gas mixture to the main exhaust line. Furthermore, a hydrogen selective catalytic reduction unit 5, located in-line on the main exhaust line, and downstream of the partial oxidation unit uses the hydrogen to continuously convert the NO<sub>x</sub> emissions in the exhaust line to nitrogen (col. 5, lines 21-57). However, Yamaguro et al. is silent in regards to the use of diesel fuel in the partial oxidation unit and whether the hydrogen selective catalytic reduction unit is operable during operating temperatures.

EP 537,968 teaches a system for treating nitrogen oxide emission from a diesel engine including a hydrogen generator and a hydrogen selective catalytic reduction unit.

Muradov teaches using a variety of fuels, such as natural gas and diesel fuel in a hydrogen generator.

Therefore, it would have been obvious to one of ordinary skill in the art to modify the teachings of Yamaguro et al., based on the teaching of EP'968 and Muradov, by treating nitrogen emissions from a diesel engine, since Muradov teaches using a variety of fuels, such as natural gas and diesel fuel in a hydrogen generator.

Hornung et al. discloses using ruthenium based reduction catalysts for selective catalytic reduction. Since the catalysts disclosed by Hornung et al. are similar it would have been obvious to expect the catalysts to possess the same property as that of the instant claim, wherein the catalysts are operable at the same operating temperature thereof.

With respect to claims 9 and 18, Yamaguro et al. discloses a shift converter (64) downstream of the partial oxidation unit (63).

5. Claims 2, 6, 11, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguro et al. (US Patent 5,441,401) in view of EP 637,968, Muradov (US Patent 6,653,005) and the admitted of prior art Hornung et al. (p. 8, line 31 – p. 9, line 5 of the instant specification), as applied to claims 1, 3, 7, 9, 10, 12, 16 and 18 above, and further in view of Manohar et al. (US Patent 6,145,501).

Applicant claims with respect to claims 2, 6, 11 and 15, wherein the partial oxidation unit is comprised of a non-stoichiometric burner. The teachings of Yamaguro et al. in view of EP 637,968, Muradov (US Patent 6,653,005) and the admitted of prior art Hornung et al. have been discussed with respect to claims 1, 3, 7, 9, 10, 12, 16 and 18, but the reference does not teach wherein the partial oxidation unit is comprised of a non-stoichiometric burner.

However, Manohar et al. teaches a burner system having a catalyst body that supports a partial oxidation catalyst operative to catalyze the fuel in the primary air/fuel mixture to intermediate combustion species, such as hydrogen, thereby reducing emissions such as nitrogen oxides (see abstract).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the teachings of Yamaguro et al., EP 637,968, Muradov (US Patent 6,653,005) and the admitted of prior art Hornung et al., by using a non-stoichiometric burner as the partial oxidation unit in a process for reducing nitrogen oxides using hydrogen, because Manohar et al. teaches a process for reducing nitrogen oxides using hydrogen by partial

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oxidation, wherein the partial oxidation unit is comprised of a burner. Such modification would have been obvious to one of ordinary skill in the art, because one of ordinary skill in the art would have expected a process for reducing nitrogen oxides using hydrogen wherein the process is conducted by partial oxidation as taught by Manohar et al., to be similarly useful and applicable to a process for the partial oxidation catalytic operation for the reduction of nitrogen oxides in gas emissions.

6. Claims 4, 5, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguro et al. (US Patent 5,441,401) in view of EP 637,968, Muradov (US Patent 6,653,005) and the admitted of prior art Hornung et al. (p. 8, line 31 – p. 9, line 5 of the instant specification), as applied to claims 1, 3, 7, 9, 10, 12, 16 and 18 above, and further in view of Yokota et al. (US Patent 5,543,124).

Applicant claims with respect to claims 4, 5, 13, and 14, wherein the partial oxidation catalyst may be a nickel-based catalyst or a rhodium-based catalyst. The apparatus of Yamaguro et al is silent as to the specific catalyst for the partial oxidation unit.

However, Yokota et al teaches providing a partial oxidation unit including catalyst, such as nickel, rhodium, etc. (col. 7, lines 12-17).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the teachings of Yamaguro et al., based on the teachings of Yokota et al., wherein the partial oxidation catalyst may be a nickel-based catalyst or a rhodium-based catalyst, because Yokota et al teaches providing a partial oxidation unit including catalyst, such as nickel and rhodium. Such modification would have been obvious to one of ordinary

skill in the art, because one of ordinary skill in the art would have expected a partial oxidation process as taught by Yokota et al., to have been similarly useful and applicable to a process for partial oxidation as taught by Yamaguro et al.

***Response to Arguments***

7. Applicant's arguments with respect to claims 1-~~7~~, 9-16, and 18 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonas N. Strickland whose telephone number is 571-272-1359. The examiner can normally be reached on M-TH, 7:30-5:00, off 1st Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jonas N. Strickland  
September 2, 2005



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